

Maleic Anhydride

**(2,5-Furandione; *cis*-Butenedioic anhydride;
2,5-Dihydrofuran-2,5-dione; 2,5-Dioxofuran;
toxic anhydride; maleic acid anhydride, MA)**



[CAS No. 108-31-6]

OEL-M: 0.1 ppm, 0.4 mg/m³

OEL-C: 0.2 ppm, 0.8 mg/m³

Occupational sensitizer: Airway Group 2;

Skin Group 2

No change

Summary of occupational exposure limits documentation

Adverse health effects of maleic anhydride (MA) are sensitization and irritation. Such conditions reportedly occur in humans at 1 mg/m³ (0.25 ppm)¹⁾. The epidemiologic studies about the sensitizing potential and respiratory disorder in the mixed-acid anhydride exposure have been reported, but no reports to date have been published about the exposure only to MA. There have been three case reports about the respiratory sensitizing potential²⁻⁴⁾, but two of them did not mention the exposure levels. Asthma developed in one of four workers after 0.83 mg/m³ of MA exposure for one month²⁾. In animal experiments, nose and eye irritation and inflammatory change depending on concentrations were found, and LOAEL was thought to be 1.1 mg/m³⁵⁾. Since paranasal squamous metaplasia was considered reversible, an uncertainty factor estimated to be

three. NOAEL became 0.4 mg/m³.

Taking these findings together, mean occupational exposure limit (OEL-M) and maximum occupational exposure limit (OEL-C) are proposed as 0.4 mg/m³ (0.1 ppm) and 0.8 mg/m³ (0.2 ppm), respectively, then OELs are not revised. There is no evident epidemiological evidence of the sensitizing potential in humans; from the available data, it should then be classified in Occupational Sensitizer Airway and Skin Group 2 from multiple case reports and animal experiment results.

Year of proposal (revision): 2015 no change

Year of proposal: 2000 (OEL-M 0.1 ppm, 0.4 mg/m³, OEL-C 0.2 ppm, 0.8 mg/m³, Occupational Sensitizer Airway Group 2, Skin Group 2)

References

- 1) ACGIH. Maleic anhydride. In: ACGIH, ed. 2013 TLVs and BEIs with 7th edition Documentation Cincinnati: ACGIH; 2011.
- 2) Lee HS, Wang YT, Cheong TH, Tan KT, Chee BE, Narendran K. Occupational asthma due to maleic anhydride. *Br J Ind Med* 1991; 48: 283-285.
- 3) Guerin JC, Deschamps O, Guillot YL, Chavaillon JM, Kalb JC. A case of asthma due to maleic anhydride (author's transl). *Poumon Coeur* 1980; 36: 393-395.
- 4) Gannon P, Sherwood Burge P, Hewlett C, Tee R. Haemolytic anaemia in a case of occupational asthma due to maleic anhydride. *Brit J Ind Med* 1992; 49: 142-143.
- 5) Short RD, Johannsen FR, Ulrich CE. A 6-month multi-species inhalation study with maleic anhydride. *Fundam Appl Toxicol* 1988; 10: 517-524.